Claims:

1. A plasticizer containing dialkyl terephthalate,
   wherein
   the alkyl radicals have a longest carbon chain of at least 4 carbon atoms and have a total number of carbon atoms per alkyl radical of 5.

2. A plasticizer according to claim 1,
   wherein
   more than 60% of the alkyl radicals are n-pentyl radicals.

3. A plasticizer according to claim 1 or 2,
   wherein
   from 70% to 99.9% of the alkyl radicals are n-pentyl radicals and from 30% to 0.1% are methylbutyl radicals.

4. A plasticizer according to claim 1,
   wherein
   from 85% to 98% of the alkyl radicals are n-pentyl radicals and from 15% to 2% are methylbutyl radicals.

5. A plasticizer according to at least one of claims 1 to 4,
   which
   in addition to dialkyl terephthalate having a total number of carbon atoms in the alkyl chain of 5 contains at least one primary plasticizer selected from dialkyl phthalates, trialkyl trimellitates, dialkyl adipates, dialkyl terephthalates, alkyl 1,2-cyclohexanedicarboxylates, alkyl 1,3-cyclohexanedicarboxylates, and alkyl 1,4-cyclohexanedicarboxylates where alkyl = alkyl radical having from 8 to 10 carbon atoms, glycol dibenzoates, and the alkylsulfonic esters of phenol where alkyl = alkyl radical having from 8 to 22 carbon atoms, and also acylated and nonacylated trialkyl citrates, polymer plasticizers, and glycerol esters.

6. A plasticizer according to claim 5,
wherein
the fraction of primary plasticizers is from 20% to 99% by mass.

7. A plasticizer according to at least one of claims 1 to 6,
which
in addition to dialkyl terephthalates having a total number of carbon atoms of 5 contains at least one alkyl benzoate where alkyl = alkyl radical having from 7 to 13 carbon atoms.

8. A plasticizer according to claim 7,
wherein
alkyl benzoate is isononyl benzoate.

9. A plasticizer according to claim 7 or 8,
which
contains at least one primary plasticizer.

10. The use of a dialkyl terephthalate as a plasticizer in a composition containing a polymer selected from PVC, PVB, PAMA or homopolymers or copolymers based on ethylene, propylene, butadiene, vinyl acetate, glycidyl acrylate, glycidyl methacrylate, methacrylates, acrylates, acrylates or methacrylates in which attached to the oxygen atom of the ester group there are alkyl radicals of branched or unbranched alcohols having from one to ten carbon atoms, or styrene, acrylonitrile or cyclic olefins, or in adhesives, sealing compounds, paints or inks,
wherein
the alkyl radicals of the dialkyl terephthalate have a longest carbon chain of at least 4 carbon atoms and have a total number of carbon atoms per alkyl radical of from 4 to 5.

11. The use according to claim 10,
wherein

the alkyl radicals of the dialkyl terephthalate have a total number of carbon atoms per alkyl radical of 5.

12. The use according to claim 10 or 11,
wherein
more than 60% of the alkyl radicals are n-pentyl radicals.

13. The use according to at least one of claims 10 to 12,
wherein
from 70% to 99.9% of the alkyl radicals are n-pentyl radicals and from 30% to 0.1% are methylbutyl radicals.

14. The use according to claim 13,
wherein
from 85% to 98% of the alkyl radicals are n-pentyl radicals and from 15% to 2% are methylbutyl radicals.

15. The use according to claim 10,
wherein
the alkyl radicals of the dialkyl terephthalate have a total number of carbon atoms per alkyl radical of 4.

16. A composition containing a plasticizer and a polymer selected from PVC, PVB, PAMA or homopolymers or copolymers based on ethylene, propylene, butadiene, vinyl acetate, glycidyl acrylate, glycidyl methacrylate, methacrylates, acrylates, acrylates in which attached to the oxygen atom of the ester group there are alkyl radicals of branched or unbranched alcohols having from one to ten carbon atoms, or styrene, acrylonitrile or cyclic olefins,
wherein

the composition contains as plasticizer a dialkyl terephthalate in which the alkyl radicals have a longest carbon chain of at least 4 carbon atoms and a total number of carbon atoms per alkyl radical of from 4 to 5.

17. A composition according to claim 16,
which
contains a dialkyl terephthalate whose alkyl radicals have a total number of carbon atoms per alkyl radical of 5.

18. A composition according to claim 16 or 17,
which
contains a dialkyl terephthalate from 70% to 99.9% of whose alkyl radicals are n-pentyl radicals and from 30% to 0.1% are methylbutyl radicals.

19. A composition according to claim 16,
which
contains a dialkyl terephthalate whose alkyl radicals have a total number of carbon atoms per alkyl radical of 4.

20. A composition according to any one of claims 16 to 19,
which
contains suspension PVC, bulk PVC, microsuspension PVC or emulsion PVC as its PVC type.

21. A composition according to any one of claims 16 to 20,
which
contains further plasticizers, fillers, pigments, stabilizers, lubricants, blowing agents, kickers, antioxidants or biocides.

22. A composition according to any one of claims 16 to 21,
which

is a plastisol, a synthetic leather, a floorcovering, an underbody sealant, a coated fabric, a wallcovering, a varnish, a paint, a sealing compound, an ink or an adhesive.

23. A process for preparing a dialkyl terephthalate whose alkyl radicals have a longest carbon chain of at least 4 carbon atoms and have a total number of carbon atoms per alkyl radical of from 4 to 5, comprising the steps of
    a) hydroformylating C_3 or C_4 olefins to give C_4 or C_5 aldehydes, respectively,
    b) hydrogenating the aldehydes obtained in step a) to the corresponding alcohols, and
    c) reacting the alcohols from b) with terephthalic acid or with a derivative of terephthalic acid to the corresponding diester.

24. A process according to claim 23,
    wherein
    step a) is carried out using a mixture of olefins which contains isobutene and/or 1-butene and 2-butenes.

25. A process according to claim 24,
    wherein
    step a) is carried out in two stages, isobutene and/or 1-butene being hydroformylated in one stage and 2-butenes in the other stage.

26. A process according to any one of claims 23 to 25,
    wherein
    step b) is carried out using a catalyst which contains from 0.3% to 15% by mass each of copper and nickel and as activators from 0.05% to 3.5% by mass of chromium and optionally from 0.01% to 1.6% by mass of an alkali metal component on a support material.

27. A process according to any one of claims 23 to 26,
    wherein

step c) is carried out by esterifying terephthalic acid or transesterifying dimethylterephthalate with the alcohol obtained from step b).

Claims:

1. A plasticizer containing dialkyl terephthalate,
   wherein
   the alkyl radicals have a longest carbon chain of at least 4 carbon atoms and have a total number of carbon atoms per alkyl radical of 5 and more than 60% of the alkyl radicals are n-pentyl radicals.

2. A plasticizer according to claim 1,
   wherein
   from 70% to 99.9% of the alkyl radicals are n-pentyl radicals and from 30% to 0.1% are methylbutyl radicals.

3. A plasticizer according to claim 1,
   wherein
   from 85% to 98% of the alkyl radicals are n-pentyl radicals and from 15% to 2% are methylbutyl radicals.

4. A plasticizer according to at least one of claims 1 to 3,
   which
   in addition to dialkyl terephthalate having a total number of carbon atoms in the alkyl chain of 5 contains at least one primary plasticizer selected from dialkyl phthalates, trialkyl trimellitates, dialkyl adipates, dialkyl terephthalates, alkyl 1,2-cyclohexanedicarboxylates, alkyl 1,3-cyclohexanedicarboxylates, and alkyl 1,4-cyclohexanedicarboxylates where alkyl = alkyl radical having from 8 to 10 carbon atoms, glycol dibenzoates, and the alkylsulfonic esters of phenol where alkyl = alkyl radical having from 8 to 22 carbon atoms, and also acylated and nonacylated trialkyl citrates, polymer plasticizers, and glycerol esters.

5. A plasticizer according to claim 4,
   wherein
   the fraction of primary plasticizers is from 20% to 99% by mass.

6. A plasticizer according to at least one of claims 1 to 5,
   which

in addition to dialkyl terephthalates having a total number of carbon atoms of 5 contains at least one alkyl benzoate where alkyl = alkyl radical having from 7 to 13 carbon atoms.

7. A plasticizer according to claim 6,
wherein
alkyl benzoate is isononyl benzoate.

8. A plasticizer according to claim 6 or 7,
which
contains at least one primary plasticizer.

9. The use of a dialkyl terephthalate as a plasticizer in a composition containing a polymer selected from PVC, PVB, PAMA or homopolymers or copolymers based on ethylene, propylene, butadiene, vinyl acetate, glycidyl acrylate, glycidyl methacrylate, methacrylates, acrylates, acrylates or methacrylates in which attached to the oxygen atom of the ester group there are alkyl radicals of branched or unbranched alcohols having from one to ten carbon atoms, or styrene, acrylonitrile or cyclic olefins, or in adhesives, sealing compounds, paints or inks,
wherein
the alkyl radicals of the dialkyl terephthalate have a longest carbon chain of at least 4 carbon atoms and have a total number of carbon atoms per alkyl radical of from 4 to 5.

10. The use according to claim 9,
wherein
the alkyl radicals of the dialkyl terephthalate have a total number of carbon atoms per alkyl radical of 5.

11. The use according to claim 9 or 10,
wherein
more than 60% of the alkyl radicals are n-pentyl radicals.

12. The use according to at least one of claims 9 to 11,
wherein
from 70% to 99.9% of the alkyl radicals are n-pentyl radicals and from 30% to 0.1% are methylbutyl radicals.

13. The use according to claim 12,
wherein
from 85% to 98% of the alkyl radicals are n-pentyl radicals and from 15% to 2% are methylbutyl radicals.

14. The use according to claim 9,
wherein
the alkyl radicals of the dialkyl terephthalate have a total number of carbon atoms per alkyl radical of 4.

15. A composition containing a plasticizer and a polymer selected from PVC, PVB, PAMA or homopolymers or copolymers based on ethylene, propylene, butadiene, vinyl acetate, glycidyl acrylate, glycidyl methacrylate, methacrylates, acrylates, acrylates in which attached to the oxygen atom of the ester group there are alkyl radicals of branched or unbranched alcohols having from one to ten carbon atoms, or styrene, acrylonitrile or cyclic olefins,
wherein
the composition contains as plasticizer a dialkyl terephthalate in which the alkyl radicals have a longest carbon chain of at least 4 carbon atoms and a total number of carbon atoms per alkyl radical of from 4 to 5.

16. A composition according to claim 15,
which
contains a dialkyl terephthalate whose alkyl radicals have a total number of carbon atoms per alkyl radical of 5.

17. A composition according to claim 15 or 16,
which
contains a dialkyl terephthalate from 70% to 99.9% of whose alkyl radicals are n-pentyl radicals and from 30% to 0.1% are methylbutyl radicals.

18. A composition according to claim 15,
which

contains a dialkyl terephthalate whose alkyl radicals have a total number of carbon atoms per alkyl radical of 4.

19. A composition according to any one of claims 15 to 18,
which
contains suspension PVC, bulk PVC, microsuspension PVC or emulsion PVC as its PVC type.

20. A composition according to any one of claims 15 to 19,
which
contains further plasticizers, fillers, pigments, stabilizers, lubricants, blowing agents, kickers, antioxidants or biocides.

21. A composition according to any one of claims 15 to 20,
which
is a plastisol, a synthetic leather, a floorcovering, an underbody sealant, a coated fabric, a wallcovering, a varnish, a paint, a sealing compound, an ink or an adhesive.

22. A process for preparing a dialkyl terephthalate whose alkyl radicals have a longest carbon chain of at least 4 carbon atoms and have a total number of carbon atoms per alkyl radical of from 4 to 5, comprising the steps of
    a) hydroformylating C_3 or C_4 olefins to give C_4 or C_5 aldehydes, respectively,
    b) hydrogenating the aldehydes obtained in step a) to the corresponding alcohols, and
    c) reacting the alcohols from b) with terephthalic acid or with a derivative of terephthalic acid to the corresponding diester.

23. A process according to claim 22,
wherein
step a) is carried out using a mixture of olefins which contains isobutene and/or 1-butene and 2-butenes.

24. A process according to claim 23,
wherein
step a) is carried out in two stages, isobutene and/or 1-butene being hydroformylated in one stage and 2-butenes in the other stage.

25. A process according to any one of claims 22 to 24,
wherein
step b) is carried out using a catalyst which contains from 0.3% to 15% by mass each of copper and nickel and as activators from 0.05% to 3.5% by mass of chromium and optionally from 0.01% to 1.6% by mass of an alkali metal component on a support material.

26. A process according to any one of claims 22 to 25,
wherein
step c) is carried out by esterifying terephthalic acid or transesterifying dimethylterephthalate with the alcohol obtained from step b).